

WHAT IS CLAIMED:

1. A decorative or structural element comprising:
  - a unitary ribbon comprising a body portion having a length (L) between a first end and a second end, thereby defining a longitudinal axis, a width (W) and a thickness (D);
    - 5 first and second major surfaces, and first and second lateral perimeter surfaces having a width substantially equal to (D) and a length substantially equal to (L); and
    - 10 a plurality of peaks ( $P_n$ ) and troughs ( $T_n$ ) between the first and second ends generally forming a sinusoidal waveform.
  2. The element of claim 1 wherein the amplitude and wavelength " $\lambda$ " are generally constant from the first end to the second end of the ribbon.
  3. The element of claim 1 wherein a tangent contacting each peak  $P_n$  is characterized as one of convex, concave, undulating or linear.
  - 15 4. The element of claim 1 wherein a tangent contacting each trough  $T_n$  is characterized as one of convex, concave, undulating or linear.
  5. The element of claim 1 wherein a tangent contacting each peak  $P_n$  is characterized as one of convex, concave, undulating or linear and wherein a tangent contacting each trough  $T_n$  is characterized as one of convex, concave, undulating or 20 linear.
  6. The element of claim 1 wherein the amplitude is generally constant but the wavelength " $\lambda$ " is variable from the first end to the second end.
  7. The element of claim 1 wherein the wavelength " $\lambda$ " is generally constant but the amplitude is variable from the first end to the second end.
  - 25 8. The element of claim 1 wherein a tangent contacting each peak  $P_n$  is characterized as convex and a tangent contacting each trough  $T_n$  is characterized as concave.
  9. The element of claim 8 wherein one of the wavelength " $\lambda$ " or the amplitude is generally constant.

10. The element of claim 8 wherein a plurality of lines bisecting a plurality of peaks or troughs are skewed relative to one another.
11. The element of claim 1 wherein a tangent contacting each peak  $P_n$  is characterized as one of convex or concave, and a tangent contacting each trough  $T_n$  is characterized as linear.  
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12. The element of claim 11 wherein the wavelength " $\lambda$ " is generally constant.
13. The element of claim 1 further comprising a second generally sinusoidal waveform ribbon adjacent to the first ribbon wherein at least some of the troughs of the second ribbon are in contact with at least some of the peaks of the first ribbon to  
10 form an offset stack.
14. The element of claim 13 further comprising at least one secure linkage between one contacting peak-trough pair to prevent relative movement there between.
15. The element of claim 1 further comprising a plurality of generally sinusoidal waveform ribbons arranged to create an offset stack with respect to the first ribbon.  
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16. The element of claim 1 further comprising a second generally sinusoidal waveform ribbon attached to the first ribbon wherein at least some of the troughs of the second ribbon are in contact with at least some of the troughs of the first ribbon to form a registered stack.  
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17. The element of claim 16 wherein at least part of the first ribbon surface adjacent to the second ribbon is secured to part of the second ribbon surface adjacent to the first ribbon to create a laminate structure.
18. The element of claim 1 further comprising a plurality of generally sinusoidal waveform ribbons arranged to create a registered stack with respect to the first ribbon.  
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19. The element of claim 1 wherein the first end is in contact with the second end.
20. The element of claim 1 wherein the generally sinusoidal waveform is interrupted by a non-sinusoidal waveform segment.
21. A decorative or structural element comprising:  
30 a unitary ribbon comprising a body portion having a length (L) between a first

end and a second end, thereby defining a longitudinal axis, a width (W) and a thickness (D);

first and second major surfaces, and first and second lateral perimeter surfaces having a width substantially equal to (D) and a length substantially equal to (L);

a plurality of peaks ( $P_n$ ) and troughs ( $T_n$ ) between the first and second ends generally forming a sinusoidal waveform; and

a first flange fixedly attached to the element and contacting one of at least some of the plurality of peaks, at least some of the plurality of troughs, or at least one of the lateral perimeter surfaces.

22. The element of claim 21 wherein the amplitude and wavelength " $\lambda$ " are generally constant from the first end to the second end of the ribbon.

23. The element of claim 21 wherein the first flange contacts at least some peaks  $P_n$  and is characterized as one of convex, concave, undulating or linear.

15 24. The element of claim 21 wherein the first flange contacts at least some troughs  $T_n$  and is characterized as one of convex, concave, undulating or linear.

25. The element of claim 21 wherein the first flange contacts at least some peaks  $P_n$  and is characterized as one of convex, concave, undulating or linear, and

wherein a second flange contacts at least some troughs  $T_n$  and is characterized as one of convex, concave, undulating or linear.

26. The element of claim 21 wherein the amplitude is generally constant but the wavelength " $\lambda$ " is variable from the first end to the second end.

27. The element of claim 21 wherein the wavelength " $\lambda$ " is generally constant but the amplitude is variable from the first end to the second end.

25 28. The element of claim 21 further comprising a second generally sinusoidal waveform ribbon adjacent to the first ribbon wherein at least some of the troughs of the second ribbon are in contact with at least some of the peaks of the first ribbon to form an offset stack.

29. The element of claim 21 further comprising a second generally sinusoidal waveform ribbon attached to the first ribbon wherein at least some of the troughs of

the second ribbon are in contact with at least some of the troughs of the first ribbon to form a registered stack.

30. The element of claim 21 wherein the first end is in contact with the second end.

5 31. A decorative or structural element comprising:

a unitary ribbon comprising a body portion having a length (L) between a first end and a second end, thereby defining a longitudinal axis, a width (W) and a thickness (D);

first and second major surfaces, and first and second lateral perimeter surfaces having a width substantially equal to (D) and a length substantially equal to (L); and

a plurality of peaks ( $P_n$ ) and troughs ( $T_n$ ) between the first and second ends generally forming a sinusoidal waveform wherein the ribbon includes at least one longitudinal twist between the first end and the second end.

15 32. The element of claim 31 wherein the at least one longitudinal twist is between two adjacent peaks.

33. The element of claim 32 wherein the at least one longitudinal twist is between a first peak and an adjacent trough.

34. The element of claim 33 wherein the longitudinal twist is an integer multiple of 20 180°.